

Claims:

1. Method of producing a radiolabelled gallium complex by reacting a Ga^{3+} radioisotope with a chelating agent characterised in that the reaction is carried out using microwave activation.
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2. Method according to claim 1 wherein the Ga^{3+} radioisotope is selected from the group consisting of $^{66}\text{Ga}^{3+}$, $^{67}\text{Ga}^{3+}$ and $^{68}\text{Ga}^{3+}$.
- 10 3. Method according to claims 1 and 2 wherein the Ga^{3+} radioisotope is $^{68}\text{Ga}^{3+}$.
4. Method according to claims 1 to 3 wherein the chelating agent is a macrocyclic chelating agent.
- 15 5. Method according to claims 1 to 4 wherein the chelating agent comprises hard donor atoms, preferably O and N atoms.
6. Method according to claims 1 to 5 wherein the chelating agent is a bifunctional chelating agent.
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7. Method according to claims 1 to 6 wherein the chelating agent is a bifunctional chelating agent comprising a targeting vector selected from the group consisting of proteins, glycoproteins, lipoproteins, polypeptides, glycopolypeptides, lipopolypeptides, peptides, glycopeptides, lipopeptides, carbohydrates, nucleic acids, oligonucleotides or a part, a fragment, a derivative or a complex of the
25 aforesaid compounds and small organic molecules.
8. Method according to claim 7 wherein the target vector is a peptide or oligonucleotide.
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9. Method according to claims 1 to 8 wherein the microwave activation is carried out at 80 to 120 W, preferably at 90 to 110 W.

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10. Method according to claims 1 to 9 wherein the microwave activation is carried out for 20 s to 2 min, preferably for 30 s to 90 s.

5 11. Method according to claims 3 to 10 wherein the $^{68}\text{Ga}^{3+}$ is obtained by contacting the eluate from a $^{68}\text{Ge}/^{68}\text{Ga}$ generator with an anion exchanger and eluting $^{68}\text{Ga}^{3+}$ from said anion exchanger.

12. Method according to claim 11 wherein the $^{68}\text{Ge}/^{68}\text{Ga}$ generator comprises a column comprising titanium dioxide.

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13. Method according to claims 11 to 12 wherein the anion exchanger comprises HCO_3^- as counterions.

14. Method according to claims 11 to 13 wherein the anion exchanger is a strong
15 anion exchanger.

15. Method according to claims 6 to 14 for the production of ^{68}Ga -radiolabelled PET tracers.

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